

Citation:

Dharod JM, Pérez-Escamilla R, Paciello S, Bermúdez-Millán A, Venkitanarayanan K, Damio G. Comparison between self-reported and observed food handling behaviors among Latinas. *J Food Prot.* 2007; 70: 1,927-1,932.

PubMed ID: [17803151](#)

Study Design:

Cross-sectional study

Class:

D - [Click here](#) for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

- To identify the magnitude of the differences between self-reported and observed food safety practices among Latino women
- To compare the observed food safety practices by sociodemographic status, food safety attitudes and prior exposure to food safety education.

Inclusion Criteria:

- Puerto Rican female
- Main meal preparer of the household
- Residing in inner city Hartford.

Exclusion Criteria:

- Non-Puerto Rican female
- Not main meal preparer of the household
- Not residing in inner city Hartford.

Description of Study Protocol:**Recruitment**

- Distributed fliers in local schools, grocery stores, WIC offices and streets of inner city Hartford
- Recruited by a trained bilingual (Spanish-English) Puerto Rican outreach worker during June 2003 through February 2004.

Design

- Three home visits in four days:
 - First visit (first day): Delivery of the food ingredients for the preparation of chicken and salad meal
 - Second visit (third day): Household observations
 - Third visit (fourth day): Closed-end self-report food safety interview survey
- Upon recruitment, dates of household visits were scheduled
- A pre-coded checklist was used for observations. Participants were asked to cook the chicken and salad meal using their own recipe but with only the ingredients provided
- A closed-end questionnaire was developed to measure self-reported behaviors
 - Questions were designed to easily compare self-reported behaviors with observed food safety behaviors
 - There were two kinds of questions:
 - Questions asking how often food safety practices were followed
 - Questions regarding specific food safety practices
 - The questionnaire was first written in English and then translated into Spanish by a Puerto Rican research consultant with expertise in food safety and experience working with this community
 - The Spanish questionnaire was not back translated into English
 - The questionnaire was administered to five community outreach workers to ensure the clarity of the survey questionnaire in both languages
 - The bilingual outreach worker-interviewer was trained by conducting five interviews per language under the supervision of a Puerto Rican research staff and other outreach workers from the Hispanic Health Council.

Statistical Analysis

- Self-reported behaviors were compared with observed behaviors by conducting cross-tabulations and chi-square tests
- Self-reported behavior results were divided into four categories:
 - True positives (TP): Desirable self-reported food safety behaviors confirmed through direct observation
 - True negatives (TN): Undesirable behaviors observed and then acknowledged through self-report
 - False positives (FP): Self-reported desirable food safety behaviors not confirmed through observation
 - False negatives (FN): Undesirable self-reported food safety behaviors uncorroborated through direct observation
- Accuracy of self-reported food safety behaviors was estimated with the formula, $(TP + TN)/\text{total sample}$
- Correlation between frequency of use of food safety practices and sociodemographic variables also was estimated. Food safety behaviors were classified as practiced (frequently or always) or not practiced (never, hardly, or sometimes)
- The sample size ($N=60$) was estimated to be large enough to allow identification of significant correlations between expected microbial loads at different stages of meal preparation, with an 80% statistical power and a tolerable alpha error of 0.05. (The microbial testing results are reported elsewhere.)

Data Collection Summary:

Timing of Measurements

- Household direct observations were conducted on second visit using a pre-coded checklist
- Self-reported interview survey was administered on third visit in participants' choice of language by a bilingual Puerto Rican outreach worker.

Dependent Variables

- Thawing method
- Use and sanitation of cutting boards and knives
- Hand-washing habits
- Washing of lettuce and tomatoes
- Method of checking chicken doneness.

Methods of Measurement

Pre-coded checklist was used for observations and closed-end questionnaire was developed to measure self-reported behaviors.

Independent Variables

- Education
- Age
- Language
- Monthly income
- Received food safety education
- Importance of food safety.

Description of Actual Data Sample:

- *Initial N*: 60 Puerto Rican women
- *Attrition (final N)*: 60 Puerto Rican women
- *Mean age*: 40 years
 - 56.7% 40 years or younger
 - 43.3% older than 40 years
- *Ethnicity*: Puerto Rican
- *Other relevant demographics*:
 - 60% (N=36) spoke only Spanish at home
 - 55% (N=33) had less than a high school education
 - 85% (N=51) were unemployed
 - 56.7% (N=34) has a monthly income of \$1,000 or less
- *Location*: Hartford, Connecticut, US.

Summary of Results:

Key Findings

- At all stages of meal preparation, hand washing with soap and water was greatly over-reported, while hands washing with water only and not washing their hands were underreported
- Accuracy of self-reported food safety behaviors was high for washing lettuce and tomatoes,

but low for hand washing with soap and water at different stages of meal preparation and thawing chicken in refrigerator

- Significant sociodemographic differences were observed for thawing chicken in refrigerator, using cutting board and washing of tomatoes
- There was a significant association ($P < 0.05$) between proper thawing method and prior food safety education, use of cutting board and higher income and washing tomatoes and having a positive attitude towards food safety
- On average, only 37% of participants accurately reported their hand washing practices at different stages of meal preparation.

Observed and Self-reported Food Safety Practices of Puerto Rican Women During Preparation of a Meal of Chicken and Salad (N=60)

Behavior	Observed Behavior No. (%)	Self-reported Behavior No. (%)	Pa
Hand washing before meal preparation			
Did not wash	25 (42)	3 (5)	0.034
Water only	20 (33)	2 (3)	
Soap and water	15 (25)	55 (92)	
Hand washing after handling chicken breast and before lettuce and tomatoes			
Did not wash	17 (28)	1 (2)	0.101
Water only	28 (47)	5 (8)	
Soap and water	15 (25)	54 (90)	
Hand washing after handling lettuce and tomatoes			
Did not wash	38 (63)	7 (11)	0.545
Water only	16 (27)	14 (24)	
Soap and water	6 (10)	39 (65)	
Cutting board used to cut chicken breast			
Yes	47 (78)	49 (82)	<0.001
No	13 (22)	11 (18)	
Meat thermometer used			
No	60 (100)	60 (100)	1.00
Washing lettuce			
Did not wash	8 (13)	5 (8)	0.001
Washed whole head in water	15 (25)	16 (27)	
After cutting, washed in a colander	37 (62)	39 (65)	
Washing tomatoes			

Did not wash	9 (15)	1 (2)	0.011
Washed whole in water	36 (60)	43 (71)	
After cutting, washed in a colander	15 (25)	16 (27)	

Other Findings

- No one reported and no one was observed thawing chicken breast in the microwave, even though most of the participants had a microwave at home
- No one reported and no one was observed using a meat thermometer. 47% of participants reported being confident of their own method for determining cooking "doneness." Also, 28% of participants mentioned "inability to use it" as a reason for not using a meat thermometer.

Author Conclusion:

Author concluded that results revealed:

- Over-reporting errors must be considered when analyzing or interpreting data derived from self-reported food safety consumer surveys
- Food safety education and positive food safety attitudes are associated with recommended food safety behaviors.

Reviewer Comments:

- *In this study direct observation was conducted only one time; it might not be representative of participants' food safety practices*
- *Presence of the observer also might affect participants' food safety practices, although the study was intentionally designed to schedule household observations before the self-reported interview to avoid bias of food safety behaviors*
- *It is not clear if the self-report questionnaire is valid and reliable. It could be that the difference between reported and observed practices is due to using an invalid or unreliable questionnaire*
- *The accuracy of self-reported food safety behaviors was estimated with percent agreement (True positive + True negative) / total sample. However, this formula does not take into consideration agreement by chance (or chance agreement). The use of Kappa statistic might improve interpretation of accuracy analysis*
- *As the authors stated in their discussions, the study participants might not be representative of Latinas' meal preparers due to their lower level of education and income and previous exposure to a food safety campaign.*

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	N/A
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions

1.	Was the research question clearly stated?	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	N/A
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	Was the selection of study subjects/patients free from bias?	No
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	N/A
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	No
3.	Were study groups comparable?	N/A
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A

3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	Was method of handling withdrawals described?	N/A
4.1.	Were follow-up methods described and the same for all groups?	N/A
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	N/A
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	N/A
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	Was blinding used to prevent introduction of bias?	No
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	No
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	No
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were intervening factors described?	N/A
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	N/A
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	N/A
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A

6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	Were outcomes clearly defined and the measurements valid and reliable?	???
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	N/A
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	N/A
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	???
7.5.	Was the measurement of effect at an appropriate level of precision?	N/A
7.6.	Were other factors accounted for (measured) that could affect outcomes?	No
7.7.	Were the measurements conducted consistently across groups?	N/A
8.	Was the statistical analysis appropriate for the study design and type of outcome indicators?	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	N/A
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	N/A
9.	Are conclusions supported by results with biases and limitations taken into consideration?	Yes
9.1.	Is there a discussion of findings?	Yes

9.2.	Are biases and study limitations identified and discussed?	Yes
10.	Is bias due to study's funding or sponsorship unlikely?	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	???